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ABSTRACT

The Copernican Plan is a way to organize high schools on the basis of research and experience concerning more effective and efficient instruction. Research indicates that large-block scheduling has proven to be very successful. In the plan, each student will enroll in one class at a time for about 4 hours each day for a period of 30 days. An alternative is to enroll in two classes of about 2 hours each day for a trimester. Curriculum instruction and credits will be based on mastery of course objectives. A block of 60 to 70 minutes each day provides teachers and students additional time for extra help, study, and planning. In the afternoon students participate in seminars of approximately 70 minutes for credits that would be awarded on the basis of successful participation rather than on mastery or examinations. Five kinds of diplomas will be offered, each with different credit requirements. The Copernican Plan allows teachers to concentrate on the individual students rather than on whole classes. Additional requirements for each student are reliable attendance, reasonable conduct, and an individualized educational plan. Appended are 11 notes. (MLF)

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THE COPERNICAN PLAN: A CONCEPT PAPER FOR RESTRUCTURING
HIGH SCHOOLS

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THE COPERNICAN PLAN
A Concept Paper for
Restructuring High Schools
by Joseph M. Carroll
AKA 87

I have an offer you can't refuse! Virtually every high school in this Nation can decrease its average class size by 20%, increase its course offerings or number of sections by 20%, reduce the total number of students with which a teacher must deal each day by 60% to 80%, provide students with regularly scheduled seminars dealing with complex issues, establish a flexible, productive instructional environment which will allow the introduction of effective mastery learning as well as most of the other improved practices recommended by instructional and the More Effective Schools research, get students to master about 25% to 30% more information in addition to what they learn in the seminars, and do all of this within approximately present levels of funding. How? By redeploying staff and students so that high school teachers can concentrate on teaching students rather than on covering classes. Simple? No. Possible? Yes. But that last sentence needs some explanation.

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But let's begin at the beginning. Why title this paper "The Copernican Plan"? Nicolaus Copernicus, a 16th century scholar, made a major contribution by explaining the movements of the planets. His contribution, in one sense, was not original research. Planetary movements had been studied and measured by many others, but their findings presented an erratic pattern which defied logical explanation. The Copernican contribution was one of perspective. If one assumed the sun to be the center of the universe rather than the earth, these movements could be explained rationally. That simple change became a revolutionary idea; indeed, the word "revolution", when defined as organizational upheaval, stems from his book, The Revolution Of The Heavenly Orbs. Copernicus' theory encountered great resistance. All could see the sun

rise in the east, set in the west, and thus move around the earth. More important, that the earth was the center of the universe and that God intended man to dominate the earth had become articles of faith. That simple change in perspective was therefore considered both wrong and dangerous. This Copernican Plan also tries to provide an operational perspective which will explain the failure of high schools to implement what is known about better instruction and will suggest a different perspective which may allow for instruction of improved quality, breadth and depth. In the process, it challenges some articles of educational faith. But first, why change?

I. The Rising Tide of Criticism of Public Schools Peaked With A National Report That Today's Educational Performance Places The Nation "At Risk": These Criticisms Demand A Substantially Improved Performance By Our Nation's Secondary Schools.

T. S. Eliot in his poem "The Hollow Men" wrote: "Between the idea And the reality, Between the motion And the act, Falls the Shadow". A shadow has fallen between the idea and the reality of this Nation's schools, gathering gradually but persistently, until now it threatens the effectiveness of the institution upon which almost 90% of our young people depend for preparation to become productive citizens. This tide of criticism crested in "A Nation At Risk", the report of the National Commission On Excellence in Education. The harsh criticism of this report created a backlash of rejection among educators. But then came a flood of other reports and studies, which with varying emphases, confirmed the judgment of the National Commission that our high schools are the problem and that the problem is serious and of national proportions. There is a consensus of concern.

The reports can be divided, roughly, into two groups. The first is best described as "consumers" of public secondary education. They include reports

such as A Nation at Risk, Educating Americans For The 21st Century, Action For Excellence, and a more recent one, Investing In Our Children. They represent large numbers of distinguished leaders from our corporate world, from the scientific/university communities, and also from the political leadership of our Nation. Their achievements command respect. Their identification of the problems of public schools is validated through their combined experience with high school graduates. They are in a position to experience the problems they describe and to assess the impact on their respective organizations. The second group is comprised of distinguished educational leaders and researchers. These reports include Horace's Compromise, A Place Called School, High School, and more recently, The Shopping Mall High School. Persons of the stature of TedSizer, John Goodlad, or Ernest Boyer also command respect. The first group is better at identifying problems than solutions. The second group is better at evaluating the present quality of programs against the quality which could and should be offered.

The litany of these reports, consumer or educator, is at once immensely complimentary and devastatingly critical. They recognize how critically important our high schools are to the quality of our citizenry and of our work force, and thus to the future of our Nation. However, they also forcefully state that our Nation's high schools are not performing satisfactorily, indeed are failing the Nation, and must be greatly improved. But this is not a demand to return to some mythical basics, to be as good as some think we were. They ask our high schools to meet a higher standard necessary for national survival in a hostile and competitive world. The question is not how good have you been but how good can you be!

II. The Reports Demand Change, But the American High School is Deeply Embedded in This Nation's Culture and Has Changed Very Little In Basic Structure During This Century.

The reports demand major restructuring. And the results must be demonstrated in student performance: learn more; know how to use knowledge; be reliable; provide quality work; show an understanding of and an interest in our political, economic, and social systems. All of this will require major improvements. Observe carefully that while it is possible to change without improving, it is impossible to improve without changing. So let's review the American high schools' track record for change.

The American high school has been an enduring institution. For three quarters of a century, a period characterized by immense social, political, economic, and technological change, the high school has not changed its basic form of organization. Whether observed in 1920 or 1980, whether located in an inner city or a small country town, there is a common pattern which characterizes our high schools. The school day is divided into seven periods of about 45 minutes, whether the subject is English or Auto Mechanics! It's organized under a principal and by academic departments. Credit revolves around the Carnegie unit, which equates learning with time-in-class. Lectures dominate instruction. The curriculum emphasizes "coverage" of a subject to make sure information is presented to students. Students must glean as much information as possible from what is presented. Those who glean effectively receive A's; those less efficient receive lower grades; however, all get the same number of credits regardless of how much they learn--except for those who fail, who get nothing. Most students enroll in six subjects each day. Students are somewhat bored by their classes; a reasonable level of boredom appears acceptable under the not-so-golden rule of "do unto others as they did

unto me". Thus, activities and sports are necessary to make classes more palatable. After four years, students are supposed to graduate, an event that is best described as a rite of passage to adult status, an educational "Bar Mitzvah".

But lack of logic notwithstanding, the American public high school provides this Nation's most commonly shared experience. It has a subliminally recognized role of trying to pull together this enormously diverse tribe of Americans. High School graduation is a sacrament of our democracy; i.e., "an outward and visible sign of an inward and spiritual grace". In recent years, the element of grace is less evident. Rigid unquestioning adherence to a familiar structure is the major contributor to this loss of grace.

III. The Present Plan of Secondary School Organization Was Designed To Implement Approaches Which Are Obsolete And Will Not Accommodate More Effective Programs.

Changes shown experimentally to be superior to traditional methods of teaching are almost never implemented in high schools. Why? Because improvements in teaching are centered around the teacher adapting instruction to individual student differences, and these more individualized approaches must be superimposed on an existing high school structure that is totally organized around the teaching of full classes, of large groups. This large group orientation effectively defeats efforts to individualize.

Consider instruction from the point of view of the high school teacher and student. High school teachers teach concurrently five class each day, each enrolling about 25 students, or about 125 students daily. Usually they teach several different subjects, sometimes in more than one discipline. The dominant operational priority is to be prepared to teach those classes each day; and teach means to present, to cover the curriculum. Dealing with so many students

and classes, teachers find that they must teach to the intellectual middle of the class. Ted Sizer's composite teacher, Horace, certainly is alive, but not well, in most classrooms. This traditional high school instructional environment is a controlling operational reality which in the past has impeded, defied, and survived legislative fiat, board policy, and administrative efforts to cause fundamental change and get improved results.

Research shows that students learn more efficiently if instruction is highly individualized and material is presented at the frontier of each student's level of understanding.^{1/} If students are more successful, success provides incentive, and incentive starts a success spiral which pays instructional dividends and improves attitudes and discipline as well. Teachers usually want to individualize. The universities and in-service programs tell them it's essential, and the elementary teachers have made some progress. But the high school teacher, faced with an overwhelming student load packaged in a procrustean schedule, finds it great in theory but simply impractical in the real world of high schools. There's a disaster gap between the universities and the high school classroom; between research and practice; "between the idea and the reality". No significant change will occur until high school teachers are provided classroom conditions which will foster highly individualized instruction. High school educators know this. That is why they constantly call for smaller classes, in spite of the class size research which shows that a smaller audience won't improve the lecture. The efforts at modular scheduling, although not successful, represent awareness of the instructional damage caused by the traditional schedule. How can high schools get a productive instructional environment?

IV. THE COPERNICAN PLAN, CONCEPTUALLY, TRIES TO ORGANIZE HIGH SCHOOLS ON THE BASIS OF RESEARCH AND EXPERIENCE CONCERNING MORE EFFECTIVE AND EFFICIENT INSTRUCTION.

The present organization of high schools is tied to tradition. This concept paper proposes to organize schools from the viewpoint of how students learn, more specifically on what research and non-traditional experience show concerning more effective and efficient instruction. It should be carefully observed that none of the concepts and proposals contained herein are new to education, although organizing a school so that a large number of them can be implemented together may be.

A. The Copernican Characteristic of This Plan is a Fundamental Reorientation of the School Schedule Which Will Provide Time to Implement Improved Instructional Practices and Programs.

Copernicus found order by changing perspectives. The Copernican assumption of this plan is that the schedule for students and teachers must be completely reoriented to provide conditions which will accommodate better instructional practice. Build the schedule to accommodate quality instruction; don't cram improved practices into the traditional, procrustean high school schedule. If this can be done, a large number of practices associated with better instruction can be implemented at once. And it can be done.

Presently, the typical high school student enrolls in six classes which meet for approximately 45 minutes each day over a 180-day school year. The Copernican Plan proposes that each student will enroll in one class at a time for about $3\frac{1}{2}$ to 4 hours each day for a period of 30 days. Each student will enroll in six of these classes each year, which will fulfill the required 180 school days. An alternative is to enroll in two classes of about $1\frac{3}{4}$ to 2 hours each for a trimester. Consider these two examples of this type of scheduling.

FULL BLOCK SCHEDULE

<u>Activity</u>	<u>Times</u>	<u>Min</u>
Arrival Time	7:40-7:50	10
Full Block	7:50-11:20	210
First Lunch/Semester I	11:20-12:05/11:30-12:40	45/70
Seminar II/2nd Lunch	12:05-1:15/12:40/1:25	75/45
Passing		10
Preparation/Help/Study (PHS)	1:25-2:35	70
Departure Time	2:35-2:45	10
Activities/Sports	2:45-5:00	135

TWO BLOCK SCHEDULE

<u>Activity</u>	<u>Times</u>	<u>Min</u>
Arrival Time	7:40-7:50	10
Block I	7:50-9:30	100
Passing		10
Block II	9:40-11:20	100
First Lunch/Seminar I	11:20-12:05/11:30-12:40	45/70
Seminar II/2nd Lunch	12:05-1:15/12:40-1:25	75/45
Passing		10
Preparation/Help/Study (PHS)	1:25-2:30	65
Departure Time	2:30-2:40	10
Activities/Sports	2:40-5:00	140

These schedules do not increase the school day for either teachers or students. They provide for normal arrival and departure times, and more normal lunch periods. The PHS period provides teachers and students additional time for make-up, extra help, study, and planning. Since the teacher is planning for only one class per day and concentrating on the different rates of progress of students and groups of students, this PHS period allows for a more collegial cooperative approach to homework, make-up, and future plans for the class. Please note that music and physical education will share the seminar periods since the instruction and role of these classes do not fit into the block schedules or the six-twelve week time frames. Clearly, there are many variations of these schedules. Also, it is possible to maintain both one and two block schedules simultaneously.

These Copernican schedules provide for a simple change which raises a myriad of questions. The fundamental question is whether or not students can actually learn as much, or indeed more, under this plan than they can under a traditional schedule. There is every reason to believe that students will learn more under a Copernican schedule. What has been the experience with block schedules? A number of independent schools have effectively utilized this type scheduling.^{2/} "But they are not public schools; they serve the elite; they have small classes." Hold your fire! Other experimental programs indicate this form of intensive instruction to be more effective. Johns Hopkins University has been studying the education of gifted students with particular attention to their learning rates. Junior high age students have completed high school mathematics courses at a high level of mastery in 75 hours, attending class 5 hours per day for 5 days a week for 3 weeks, or a total of 15 days. This is only 50% of the time allocated to these classes in a traditional high school.^{3/} "But these are gifted students. It won't work for students of average or below average ability." The best indications are that it will. For example, vocational schools have regularly utilized large block scheduling and this format has proven to be very successful.

The immense amount of research and experience with programmed instruction is informative. Programmed instruction has four basic characteristics: 1. Focus attention on a limited amount of material at one time. 2. Require a response that is measurable. 3. Provide immediate knowledge of results after every response; i.e., rapid feedback. 4. Permit each student to respond at his own pace.^{4/} Perhaps the most extensive and impressive results of programmed instruction comes from the U.S. military, dealing with high school graduates having normal ranges of abilities, using large block instructional programs

combined with the careful planning required for programmed instruction. Results show that mastery of 90% or above could be obtained by students in 24% to 50% less time than under conventional instruction.^{5/} And this research was based upon a large number of courses and substantial numbers of students.

Experience with summer programs shows that by meeting three to four hours per day in a period of six weeks, students can complete work equivalent to that of a regular high school course, or about 25% to 30% less time than is provided in the traditional schedule.^{6/} Please note that this experience includes non-remedial, regular high school courses in all major disciplines which were taken for credit by high school students with normal ranges of aptitude.

Many students have particular difficulty in functioning effectively in regular secondary schedules and are placed in alternative programs. These programs consistently provide a large block, self-contained instructional environment where students receive a great deal of individual attention and in which instruction is planned specifically for their needs. Mainstreaming is introduced as students develop the capacity to cope with the typical high school environment. It should be noted that in many of these cases, the students have normal academic potential but may have emotional or perceptual problems which make it difficult for them to cope with the impersonality and distractions of a traditional high school. Again, experience shows that these students learn much more effectively in a simplified, concentrated environment which allows them and their teachers to concentrate on their particular instructional requirements.

In summary, large block instructional schedules have worked well for private school students, for gifted students, for vocational students, for recent high school graduates in military educational programs, for regular high school students who attend non-remedial academic summer programs, and for special needs students who cannot cope with regular schedules. If all of these

different types of students can learn more effectively under a large block educational schedule, there is reason to believe that this type of scheduling can be effective for every student.

"But doesn't that statement go against logic and experience? Why is this true?" Because the traditional schedule is so terribly inefficient. A review of the research on time-on-task consistently shows tremendous waste. Probably about 40% of high school time is not available for instruction.^{7/} But the time loss in the traditional high school is even greater, since the time considered to be on-task is fragmented and impairs effective instruction.

"But will students retain as much of what they learn?" While the research on retention for either the traditional or the Copernican type schedule is not extensive, what there is indicates that students will retain what they learn at least as well.^{8/} The concentration of attention and more immediate, concentrated feedback provides powerful reinforcement.^{9/} Perhaps most important, students remember best that which they really understand and can apply; the memorized abstraction is not remembered much beyond the next test.^{10/} The quality of instructional time is the critical factor. Let's consider how The Copernican Plan can facilitate quality instruction.

B. The Copernican Plan Provides Teachers With Working Conditions Which Allow Planning And Instruction To Concentrate On The Individual Students Rather Than On Whole Classes.

The traditional orientation and organization of secondary education is to teach classes of students rather than individual students. Teachers can't individualize instruction daily for 125 students packaged in 45 minute modules. So, teachers concentrate planning on those five classes; "Horace" can only provide a little individualization for those in difficulty and for a few of the brightest. Under The Copernican plan, the average class size in any high school

would be reduced about 20%. "How is that possible?" Teachers usually teach five classes, but the students typically take six classes. Under The Copernican Plan, each teacher will teach six classes in a year, increasing the number of classes offered by 20%, which results in a 20% reduction in class size. It also provides 20% more sections per year, which would allow for more flexible grouping of students, according to either interest or ability. If classes range from 10 to 25 students and average 20, they would now range from 8 to 20 and average about 16 students. More important, whether the class size is 8 or 20, that number will be the total number of students with whom the teacher is dealing at any one time, and that will be the only class for which the teacher prepares. Even with two 2-hour classes for a trimester, the daily student load drops more than 60%. The time and effort the classroom teacher concentrates on preparing for five classes now can be concentrated on planning for small groups or for individual students within a single class, the heart and soul of the more individualized instruction which research and experience indicates is more effective. Teachers teach students rather than cover classes.

There are other advantages. Presently, teachers are not in control of the instructional environment. For example, assigning homework is a problem because every teacher must be aware that other teachers are also assigning homework. Homework isn't individualized. High School field trips are limited because they take students out of other classes. Scheduling outside lectures or combining classes with other teachers for joint presentations seldom occurs because of scheduling problems. Even taking advantage of those "teachable moments" usually loses out to the bell schedule. It is not possible to evaluate each student's progress daily; rapid feedback seldom occurs. Peer teaching is so difficult to manage, and teachers don't trust that which they can't monitor.

Under The Copernican Plan, the teacher has total control of the

instructional environment. Homework can be adapted for each student or group of students in the class. Field trips do not pull students from other classes. A marine science class could literally spend a week on the beach; a month's foreign exchange also presents no serious conflicts. Combining classes and scheduling special events is simplified. The pace of the class is totally under the teacher's control. Students' progress can be assessed individually and daily. Peer teaching is easily planned and monitored. Virtually all of the practices which are associated with more effective schooling can be carried out much more effectively under this type of scheduling.^{11/}

C. The Interest/Issues Seminars Will Provide Quality And Depth, Relevance And Maturity For Each Student's Education.

A major criticism of American high schools is that students are not given opportunities to deal with complex issues. Instruction lacks both quality and relevance. Educators generally agree with these criticisms, but the problem is finding the time for either students or staff in a busy school day. Once again, let us examine how high schools are organized. Curriculum is now organized by academic disciplines. However, the nature of complex issues is essentially inter-disciplinary. For example, dealing with the question of environmental pollution or nuclear control will involve an understanding of science, mathematics, history, civics, government and law, and ethics. Consideration of these issues will require an ability to read, to write, to understand the media, and to speak effectively either as a leader or participant. A critical, limiting factor is that considering complex issues can result in not "covering" the course material; coverage has first priority! As a result, the consideration of complex issues is incidental and is left pretty much to chance.

The Copernican Plan proposes to incorporate consideration of complex issues

as part of the regular educational program. Under the Plan, the regular academic disciplines and program would be taught more efficiently in the block or morning schedule, this leaves the afternoons open for students to participate in Interest/Issue Seminars of approximately 70 minutes. "I-credits" would be awarded for these seminars. The "I" stands for "integration", not for interest or issues, since the purpose of these seminars is to integrate knowledge and understanding. "I-credits" would be required for graduation and would be awarded on the basis of successful participation rather than on mastery or examinations. A student must be present; a student must participate. For seminars, students would not be grouped on the basis of ability but rather on the basis of interest, which reflects the philosophy and to a lesser extent, the reality of public and political organizations in this Nation. A student could earn more credits by providing leadership and could receive fewer credits or no credits if performance was marginal; e.g. failure to attend, or disruptive behavior. The format for the seminars should be very flexible. They would provide fine opportunities to involve the community directly with students, which would help bridge the generation gap and add considerably to the maturity of the student's school experience. The I-seminars would require a major curriculum development program in order to have a bank of seminars planned and available. In addition, it would require a permanent student-parent-staff planning group in order to identify current issues and develop plans for appropriate seminars.

D. Curriculum, Instruction, and Credits Will Be Based on Mastery of Course Objectives Rather Than "Coverage" and Time-in-Class.

The various reports demand that schools require students to master course objectives. Presently, mastery learning won't occur in high schools; the con-

sistent failure of attempts to cause teachers to apply programmed instruction enmasse to 125 students daily supports this statement. And the semi-annual criterion referenced test which supposedly indicates mastery is really only an improvement in the present evaluation system. Mastery learning requires teachers to interact constantly with each student; to be able to "coach" students. Under The Copernican Plan, the teacher's total control of instructional time and the small student load makes it possible to individualize instruction and to really assess accurately the progress that each student makes in achieving course objectives. Mastery learning also addresses the issue of quality. Regurgitating fact on command is not enough; depth of understanding requires interaction.

Another problem of the present system is that the same number of credits are awarded for a D as for an A. This, in effect, recognizes poor work as worthy of credit, indeed, equal credit. Under the Copernican mastery system, the teacher must be assured that the student has mastered certain course objectives before credit is awarded. The more able students may earn more credits in a course than the less able, but however much each student learns is learned well.

What will be the impact of mastery learning on curriculum? It will in no way change the basic objectives of any course now being taught. Algebra I and U.S. History will continue to be Algebra I and U.S. History in terms of the information and concepts learned. However, the course objectives for each course will have to be more clearly identified than is now the case. The key is that the teacher deals with one subject and a small number of students and has time to plan instruction and assess results individually.

E. Students Should Master About 25% More Material Plus The Benefits From the

Interest/Issues Seminars

The reports demand all students learn much more. Some reports recommend the longer school days and years required of students in other industrialized countries, so students have time to learn more. Rather than import a system from another culture, let's develop one in keeping with this Nation's beliefs and traditions. "Concern for the individual" and "efficiency" are consistent with our National beliefs, character, and culture. Based on experience with programmed instruction and large block learning schedules, it appears possible to increase the actual mastery of course material within the present hours and days because teachers have an opportunity to use more efficient, more individualized teaching strategies.

Comparing the Copernican and traditional plans in terms of material mastered is difficult. First, the present plan of organization is neither geared to mastery nor is it evaluated in these terms. However, experience with large block schedules indicates equivalent results in less time. Under The Copernican Plan, a student should be able to complete six courses and accomplish this before noon, leaving the afternoon for music and physical education, which don't fit into the large block schedule, and the I-seminars. Mastery should exceed that achieved under the traditional schedule by at least 25 percent. Also, the opportunity to deal with complex issues is an important bonus; the quality of learning should be greatly improved, and it will be done within the present school year and school day. If successfully implemented, the Copernican Plan will meet the objectives of the various reports through more efficient organization.

F. Students Will Be Evaluated Based on Mastery Credits and I-Credits Rather Than By Letter Grades.

Americans believe in systems where "you get what you earn". Appropriately, schools should develop reward systems based on the premise that "you get what you learn". The Copernican Plan proposes to substitute the mastery credits earned for the traditional A through F grading system. This change would be a major and visible break with strongly held tradition. "Why change?" Because the traditional grading system gives the same number of credits for an A as for a D, disregarding significant difference in performance. Grade weighting is misleading because the mastery of advanced material in an honors course is weighted while mastery of the same information a year later in a regular course is given fewer grade points. And last, but by no means least, the "D" student gets full credit while the "F" student must retake the entire course or take another course. It is unlikely that a failing student fails to learn something. Also, research consistently shows that strategies to avoid non-promotion are an important characteristic of the more effective school.11/

How would this be done? Simpler is better, according to Ted Sizer, so let's keep it simple! Teachers know what objectives they are trying to achieve in the courses they now teach and how to determine if they are learned. And if they don't know, they should! Divide each full year of course objectives into approximately tenths and award one credit for each tenth mastered. Then adapt graduation requirements to this numeric scale. Perfect? No, but it's a helluva lot better than the present system. It's rational. It provides the teacher with a solid link to the familiar, and over the years of working in a manageable teaching environment, the definition and measurement of mastery can be improved. And, it isn't necessary to create hundreds of behavioral objectives, which have resulted primarily in a lot of objectionable behavior!

There is an important conceptual difference between the proposed Coperni-

can and the traditional grading systems. The traditional system assumes that only the A students are excellent while under mastery learning, excellence permeates the system because whatever one learns is learned completely and competently; it is available to every student. If a student masters only three or four credits, he hasn't failed. He just needs to learn more.

Two problems associated with the traditional grading system are the grading curve and cheating. The present organization of secondary schools provides for large group instruction but insists on individual accountability. As a result, teachers often discourage students from working together. The test is supposed to be a test of each student's performance and is the primary basis for grading. From a student's viewpoint, if one helps too many other students, he or she may "ruin the curve"; a very high performance by one or two students may also net the same result. Thus, in many ways, directly and indirectly, there is pressure for the good student not to share and for the poor student to cheat in order to get a better grade and meet the competition. Also, dealing with large classes and daily student loads makes it impossible for teachers to work directly and individually with every student, and this increases reliance on tests taken by the entire class.

The Copernican Plan, combining control of time with mastery learning and the substitution of credits earned for traditional A to F grades, provides a number of instructional advantages. Among the characteristics of more effective schooling are cooperative activity and group interaction in the classroom, deemphasis on strict ability grouping and interaction with more accomplished peers. Under the Copernican Plan, there is no fear of the curve. If every student masters every objective, all get full credit. Also, there is much less need for cheating since students receive all the credits they earn.

Furthermore, there is less opportunity to cheat because the teacher is doing more coaching of small groups and individual students. Teachers would undoubtedly continue to use tests and quizzes, but they could individualize the use of these instruments, and they could easily confirm mastery by direct work with a student. Both the pressure to cheat and the opportunity to cheat are greatly reduced.

"But wouldn't the substitution of credits for grades confound the college admission officer and jeopardize a student's chances to be admitted to colleges, particularly demanding ones?" Developing a transcript useful to college admission officers would not be as great a problem as it might seem. Admission officers already know that an A in English IV is not equivalent between two high schools; they hope it will be within the same high school. The major determinants, rank in class, ACT/SAT scores, and achievement test scores won't change. Certain levels of mastery could be weighted for rank in class. The actual names of the courses would not be different; only the fact that ten credits meant total mastery and six credits means only partial mastery of the subject would have to be substituted for A and D. The fact that mastery rather than traditional grading was the basis of evaluation should help. Also, descriptive diplomas and the use of individual educational plans would substantially improve the communicative capacity of the transcript; these will be presented later in this report.

G. Five Diplomas Will Be Offered and Each Will Have Different Credit Requirements

The great majority of American high schools offer one diploma and the standards for receiving that diploma are the same for all students. Multiple diplomas are proposed under The Copernican Plan, and five are suggested:

Academic Honors Diploma, Academic Diploma, Occupational Honors Diploma, Standard Diploma, and a Completion Diploma. Students who wish the more prestigious and demanding diploma must earn more credits, both mastery credits and I-credits. Also, it is as critical to attach honor to high performing students who enter the work force after graduation as it is to able students continuing their educations. This practice would add incentive and rewards for achieving more. It should be carefully noted that Integration credits (I-credits) should also be required for each of these diplomas, which is an entirely new requirement. A word about the completion diploma. It would be given to any student who did not meet the minimum number of credits. It would certify that the student's attendance was reliable and his or her conduct and effort were satisfactory and reliable. Every student's transcript should define the diplomas that were available as well as the diploma which was awarded so that the official record reflects accurately the accomplishments of each student.

H. Reliable Attendance and Reasonable Conduct Will Be Basic Skills Required for Graduation.

A decade of Gallup Polls on Education indicates the major complaint concerning our Nation's public schools, and particularly the high schools, is lack of discipline. Poor conduct, unreliable attendance, and lack of civility are major concerns presented by the "consumer" reports. Is conduct in school that important? Study after study has shown that the major reasons for the dismissal of employees are related not to an inability to do the job for which they were hired, but an unwillingness to report reliably or to conduct themselves properly. And the "lemon" is a byproduct of and a "cancer" to this country's industrial strength. Apparently "will do" is as important as "IQ".

If good conduct is so important, let's connect it directly to the reward

system. Standards of conduct and reliability should be separately identified, evaluation systems developed, and these standards should be met by every student before a diploma is awarded. Certainly, these qualities are as important as the ability to read and calculate in terms of the future success of both students and this Nation. Developing a fair and effective evaluation system will require breaking new ground and thus will present difficulties, but it should be possible. If the high school diploma is to be something other than a "ticket to nowhere", students must understand that developing these qualities is most important.

I. Every Student Should Have an Individualized Educational Plan; Parents Should Be Expected to Approve the Plan.

For more than a decade, the Nation's educational establishment has become acquainted with the term IEP, Individual Educational Plan, as it is used in connection with the implementation of Public Law 94-142 for Special Needs students. While these programs have created some controversy, the best evidence indicates that the IEP helps these students prosper, primarily because the students, the parents and the schools know what they are trying to achieve and have some basis for measuring progress. Conceptually, it is very similar to management-by-objectives.

The Copernican Plan can provide an instructional environment which will allow for the highly individualized instruction necessary to make the IEP work for regular students. Professionally, the school should try to treat students as clients rather than wards, as individuals with specific interests and objectives which the school should help them to achieve. The development of an IEP would require greater participation of parents and place more responsibility on students in developing their plans.

The general use of the IEP can, to some extent, individualize the diploma. While students should not be coerced into deciding on whether to be a surgeon or a policeman, they should realize that there is life after high school, and choices have to be made; e.g., going to college, a particular college or technical school or to a job. Also, time must be allowed to prepare for these choices. The student's educational plan should indicate his or her current target and the appropriate levels of mastery of subjects recommended to achieve that objective. The school must recognize that students are young men and women who are maturing and their interests and perceptions of their opportunities and abilities are expected to change. It is also clear that a student who has been seeking a standard diploma may have great difficulty in deciding to seek an Honors diploma in the middle of his or her third year. A decision to change a diploma in no way removes the responsibility of the student to master the necessary course work. However, review and reassessment of capabilities and objectives should be part of the client experience in every high school.

J. The Copernican Plan Provides a More Mature, Less Frenetic, Dejuvenilized Instructional Climate for Students.

American folklore describes a teenager as a hyperactive, frenetic individual who is very difficult to understand. The solution to that hyperactive characteristic on the part of the traditional high school is to place the student in a condition of perpetual motion and interrupted attention! Presently, a typical high school student will be in seven classes, a homeroom, and lunch or nine different locations in a 6 1/2 hour day. In addition, if the student has physical education, he or she may have had to change clothes twice and shower once. Students are encouraged to partake in various activities and sports, which for many occupies an additional two hours during the day, and then

the student is expected to complete his or her homework. Since it is impossible for the teachers to coordinate, much less individualize, their homework assignments, homework can range from very little to an immense amount of work on any particular night. At no time prior to secondary school nor after leaving secondary school for either further education or employment, is a student placed in such an impersonalized, unproductive, frenetic environment. A serious question can be raised as to whether the school is responding to the alleged innate, hyperactive characteristics of the teenager or is creating and complicating these characteristics.

If the high school is viewed in historical perspective, the fundamental problem becomes much clearer. Until approximately 1930, most Americans completed their education at the 8th grade and went to work. These young people were expected to conduct themselves as young men and women. An old saying from our Colonial days, "Sweet sixteen and never been kissed", provides a message for our times. It comes from a period when most young people had accepted full or almost full adult responsibilities by the age of 16. The Jewish Bar Mitzvah and the Christian Confirmation and, for that matter, the various tribal rites which award adult status appear to occur around the age of 12 or 13. The American tribe, during the Great Depression of the 1930s, pressured young people to keep off the job market by continuing in school and in the process, extended childhood by about four years, seriously weakening their feeling of responsibility for adult performance. As society has become more technological and the Nation has become super industrialized, the need for more education certainly has been justified. However, it is extremely important that these young men and women be placed in a more adult, mature environment and be expected to act accordingly. One of the major objectives of the Copernican Plan is to "dejuvenilize" the high

school.

The word environment refers to the totality of an experience, physical, organizational, psychological. Virtually every aspect of this plan relates to this objective. The substitution of mastery learning for the games playing and the grading curve, the organization of the schedule to allow for concentration and more mature and in-depth study of an academic discipline, the development of individual educational plans and the establishment of objectives, the ease of scheduling field trips or bringing community resources to the classroom, the recognition that good conduct is basic and necessary for graduation, the expanded opportunities for students to work more closely with teachers almost as if they were coaches, and the in-depth opportunity to follow interests and to confront issues provided by daily seminars are all intended to provide an adult, mature, productive, personalized, relevant and interesting high school experience for each student.

V. Implementation of a Copernican Type Plan Will Have Major Impact on Schools; But the Choice is Really Between Internally or Externally Created Change.

This proposal requires major change in organizing high schools, but the benefits which can be achieved justifies the effort. An organization and a living organism are in some ways quite similar. Each evolves ways of coping with its existing environment. If a change is introduced, the organization or the organism either adapts to accommodate that change or rejects it. Those that do neither, die out. Vouchers, tuition tax credits, and several recent legislative actions should be viewed from this perspective. Administrators, whether in private or public enterprise, are well aware that organizations faced with change can develop formidable rejection mechanisms. This is part of the problem, but it is not an adequate justification of the status quo. Will

educators meet the Nation's demands, or will others make the changes? The National reports are right; the stakes are high. As President Kennedy once said: "If not us, who? If not now, when?" The ball is in the educators' court!

NOTES

1/ Encyclopedia of Educational Research, 4th ed., American Educational Research Association, The MacMillan Co., N. Y., 1969, p. 1019.

2/ Barbara Schieffelin Powell, Intensive Education: The Impact of Time on Learning, Educational Development Center Inc., Newton, MA, 1976. This is the only research the author could find which specifically studied large block, intensive programs.

3/ The author's junior high school students have participated in this program.

4/ Encyclopedia of Educational Research, 4th ed., American Educational Research Association, The MacMillan Co., N. Y., 1969, p. 1017.

5/ Ibid, p. 853.

6/ Encyclopedia of Educational Research, Revised Edition, American Educational Research Association, The MacMillan Co., N. Y., 1950, p. 1167.

During the author's tenure as superintendent of the Los Alamos, New Mexico Schools, 1970, 1971, and 1972, pilot non-remedial summer courses were offered in English, Math, Biology, Chemistry, Industrial Arts, and Art. Courses met four hours/day for six weeks, or 25% less time than during the regular year. Student performance was fully comparable to that achieved during the regular school year.

Encyclopedia of Educational Research, 5th ed., THE FREE PRESS, MacMillan Publishing Co., Inc., N. Y., Vol. 2, pp.706-707.

Barbara Schieffelin Powell, INTENSIVE EDUCATION: The Impact of Time On Learning, Education Development Center Inc., Newton, MA, 1976, pp. 12-13.

7/ Richard A. Rosmiller, Time-On-Task: A Look At What Erodes Time For Instruction, THE BEST OF THE NASSP BULLETIN: Readings in Secondary School Administration, pp. 135-136.

8/ Barbara Schieffelin Powell, INTENSIVE EDUCATION: THE IMPACT OF TIME ON LEARNING, Educational Development Center Inc., Newton, MA, 1976, pp. 13-14.

9/ Encyclopedia of Educational Research, 3rd ed., American Educational Research Association, The MacMillan Company, N.Y., p. 758. "One of the most firmly established facts concerning reinforcement is that the effect of any reinforcing event upon a response depends critically upon the temporal interval between them."

10/ Robert Calfee, Cognitive Psychology and Educational Practice, REVIEW OF RESEARCH IN EDUCATION, American Education Research Association, 1981, pp. 3-73. "The richness and strength of an idea in long term memory depends largely on two principles--: frequency and contiguity. The more often we encounter a particular kind of experience, the richer its representation in memory; the more closely two experiences occur in time and space, the greater the likelihood that the arousal of one idea will invoke the other." The organization of knowledge is also most important to memory. p. 20.

11/ Donald E. MacKenzie, Research for School Improvement: An Appraisal of Some Recent Trends, Educational Research, April 1983. This paper presented an excellent summary of research and was used as a basis for preparing The Copernican Plan.